

UNITED STATES STEEL - GARY WORKS Gary, Lake County, Indiana

TDD #: T05-9308-015 PAN #: EIN0218VAA



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September 27, 1993

Ms. Pfundheller
Deputy Project Officer
Emergency Response Section
United States Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604

RE: United States Steel - Gary Works, Gary, Lake County, Indiana

TDD#: T05-9308-015 PAN#: EIN0218VAA

Dear Ms. Pfundheller:

On August 12, 1993, the United States Environmental Protection Agency (U. S. EPA) tasked the Ecology and Environment, Inc. (E & E) Technical Assistance Team (TAT) to assist Thad Slaughter of the U. S. EPA Resource Conservation and Recovery Act (RCRA) Division with lagoon sampling at the United States Steel Corporation - Gary Works (U.S.S. - Gary Works) site located in Gary, Lake County, Indiana. The TAT was tasked under Technical Directive Document (TDD) # T05-9308-015. The following letter report outlines the information obtained by the TAT during sampling activities conducted on August 13, 1993.

The U.S.S. - Gary Works site is a Division of the USX Corporation and is located at One North Broadway Avenue, Gary, Lake County, Indiana. The Technical Assistance Team members (TATms) John Nordine and Lisa Ende met Thad Slaughter at 0924 hours on August 13, 1993 at an off-site location and proceeded to the site. The teams arrival and sampling event was unannounced in order to inhibit U.S.S. - Gary Works from altering their daily pumping event. The purpose of the visit was based on the receipt of an anonymous letter by the U.S. EPA. The letter was written by a person concerned with the pumping and disposal operations of contaminated water at the plant. According to the letter, the

person suspected hazardous waste was being pumped into on-site lagoons. The lagoons are former above ground storage tank secondary containment areas with earthen dikes. The tanks have been removed from service.

Upon arrival at the facility, Slaughter and the TATms met with U.S.S. - Gary Works representatives Jerry Botkin and Pat Murphy, Mark Rupnow (sewer project engineer), Les Arnold (plant analytical manager) and Glen Rosenaw (Environmental Department The site representatives informed Slaughter and the TATms in the reason for and the procedures involved in the pumping of the water. The purpose for pumping the water centered around a consent decree U.S.S. - Gary Works has with the U.S. EPA - Water Division to remediate the sewer lines. remediation procedure involves the installation of wells at fifty foot intervals along a 1,000 foot section in which the sewer lines are to be repaired. The wells are used to dewater the area and the water is pumped into the former dike areas also referred to as lagoons. Depending on where the work is being performed dictates the number and location of wells that operate on a given day.

After the brief meeting with the site representatives, the TAT and Slaughter were escorted to the lagoon outfall location. The TAT observed a brown tinted liquid in two of three lagoons. The brown tinted liquid was obviously discharging into the lagoons from a large outfall pipe. A photoionization detector (Hnu) was utilized to conduct air monitoring to determine if volatile organics may be emanating from the lagoon. The Hnu reading taken near the outfall pipe read 4 ppm above background. The vegetation that existed in and around the lagoon was dead. The TAT collected two samples from this area, Lagoon One Outfall and Lagoon Two Outfall. prior to collecting well samples.

Upon completion of the lagoon samples, the U.S.S. - Gary Works representatives escorted Slaughter and the TAT to the operating wells. The TAT surveyed the wells with the Hnu and obtained readings at two wells, DW2 and DW4. The Hnu readings were 2 ppm and 3 ppm above background respectively. Samples were then collected from these two wells and labelled DW2 and DW4. In addition to the Hnu readings, an oily layer topped several of the samples as identified through some of the samples containers.

Per the request of U.S.S. - Gary Works representatives, TAT simultaneously collected samples for Gary Steel to run duplicate analysis. The U.S.S - Gary Works sample collection procedure was assisted by Les Arnold.

All samples were collected in accordance with the E & E Standard Operating Procedures and shipped to the EMS Heritage Laboratory in Romeoville, Illinois for analysis. Samples were analyzed for RCRA metals, total cyanide and sulfide, semivolatile and volatile organic compounds. Analytical results were received within the fourteen day verbal turnaround time and a quality assurance level

two data validation package was received within the twenty-one day hard copy turnaround time.

Analytical results reveal all samples contain hazardous levels of benzene as defined by RCRA limits (0.5 ppm). Several other polycyclic aromatic hydrocarbons and arsenic were also identified in the samples. For a complete review of the analytical results consult Table 1.

If you have any questions regarding this report, please feel free to contact me at the Chicago E & E TAT office.

Sincerely,

Lisa M. Ende

Project Manager

cc: Tom Kouris, TATL
Ken Theison, OSC
Thad Slaughter, RCRA

ATTACHMENTS: Table 1

Data Validation Memos

Table - 1 RESULTS OF CHEMICAL ANALYSIS OF U.S. STEEL (GARY STEEL SITE)
TAT-COLLECTED SAMPLES

	Sample Number				
Sample Collection	I A GOON #1	T 4 COON #2	DIIO	DII/	
Information	LAGOON #1	LAGOON #2 OUTFALL	DW2	DW4	
and Parameters	OUTFALL	OULALL			
Compound Detected					
(values in μg/L)					
Volatile Organics					
chloromethane	BDL	BDL	BDL	BDL	
bromomethane	BDL	\mathtt{BDL}	BDL	\mathtt{BDL}	
vinyl chloride	\mathtt{BDL}	BDL	BDL	\mathtt{BDL}	
chloroethane	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
methylene chloride	\mathtt{BDL}	BDL	BDL	BDL	
acetone	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	BDL	
carbon disulfide	\mathtt{BDL}	BDL	BDL	BDL	
1,1-dichloroethene	BDL	BDL	BDL	BDL	
1,1-dichloroethane	\mathtt{BDL}	\mathtt{BDL}	8	\mathtt{BDL}	
1,2-dichloroethene (total)	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	BDL	
chloroform	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
1,2-dichloroethane	\mathtt{BDL}	BDL	\mathtt{BDL}	\mathtt{BDL}	
2-butanone (MEK)	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
1,1,1-trichloroethane	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
carbon tetrachloride	\mathtt{BDL}	BDL	BDL	\mathtt{BDL}	
vinyl acetate	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
bromodichloromethane	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
1,2-dichloropropane	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	BDL	
cis-1,3-dichloropropene	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	BDL	
trichloroethene	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
dibromochloromethane	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
1,1,2-trichloroethane	\mathtt{BDL}	BDL	\mathtt{BDL}	\mathtt{BDL}	
benzene	590	580	12	6,400	
trans-1,3-dichloropropene	\mathtt{BDL}	\mathtt{BDL}	BDL	\mathtt{BDL}	
bromoform	\mathtt{BDL}	\mathtt{BDL}	BDL	\mathtt{BDL}	
4-methyl-2-pentanone	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
2-hexanone	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
tetrachloroethene	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	
toluene	34	32	19	120	
1,1,2,2-tetrachloroethane	BDL	BDL	\mathtt{BDL}	\mathtt{BDL}	
chlorobenzene	BDL	\mathtt{BDL}	BDL	\mathtt{BDL}	
ethylbenzene	51	49	3 E	34	
styrene	BDL	BDL	BDL	\mathtt{BDL}	
xylenes (total)	51	49	3 E	34	
*	\mathtt{BDL}	130 E	240 E	760 E	
benzofuran	BDL	BDL	BDL	70 E	

 $[\]star$ - Also unknown C9 hydrocarbon E - Estimated

BDL - Below Detection Limit

Table - 1 RESULTS OF CHEMICAL ANALYSIS OF U.S. STEEL (GARY STEEL SITE)
TAT-COLLECTED SAMPLES

Carral Callagation		Sample	Number	· · · · · · · · · · · · · · · · · · ·
Sample Collection Information	LAGOON #1	LAGOON #2	DW2	DII
and Parameters	OUTFALL	OUTFALL	DWZ	DW4
Semivolatile Organics				
phenol	16	15	BDL	BDL
bis(2-chloroethyl)ether	BDL	BDL	\mathtt{BDL}	BDL
2-chlorophenol	BDL	BDL	\mathtt{BDL}	BDL
1,3-dichlorobenzene	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}
1,4-dichlorobenzene	BDL	BDL	\mathtt{BDL}	BDL
benzyl alcohol	BDL	BDL	\mathtt{BDL}	BDL
1,2-dichlorobenzene	BDL	BDL	\mathtt{BDL}	BDL
2-methylphenol	41	37	BDL	BDL
bis(2-chloroisopropyl)ether	BDL	BDL	\mathtt{BDL}	BDL
4-methylphenol	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}
n-nitroso-di-n-dipropylamine	BDL	\mathtt{BDL}	\mathtt{BDL}	BDL
hexachloroethane	BDL	BDL	\mathtt{BDL}	BDL
nitrobenzene	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}
isophorone	BDL	BDL	\mathtt{BDL}	BDL
2-nitrophenol	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}
2,4-dimethylphenol	BDL	\mathtt{BDL}	\mathtt{BDL}	BDL
benzoic acid	BDL	\mathtt{BDL}	\mathtt{BDL}	BDL
bis(2-chloroethoxy)methane	BDL	\mathtt{BDL}	BDL	BDL
2,4-dichlorophenol	\mathtt{BDL}	BDL	\mathtt{BDL}	BDL
1,2,4-trichlorobenzene	\mathtt{BDL}	\mathtt{BDL}	BDL	BDL
naphthalene	370	120	\mathtt{BDL}	1300
4-chloroaniline	BDL	\mathtt{BDL}	BDL	BDL
hexachlorobutadiene	BDL	\mathtt{BDL}	BDL	BDL
4-chloro-3-methylphenol	BDL	\mathtt{BDL}	\mathtt{BDL}	BDL
2-methylnaphthalene	500	410	\mathtt{BDL}	1600
hexachlorocyclopentadiene	\mathtt{BDL}	BDL	BDL	BDL
2,4,6-trichlorophenol	\mathtt{BDL}	BDL	BDL	BDL
2,4,5-trichlorophenol	BDL	BDL	BDL	BDL
2-chloronaphthalene	BDL	BDL	BDL	BDL
2-nitroaniline	BDL	BDL	BDL	BDL
dimethylphthalate	BDL	BDL	BDL	BDL
acenaphthylene	42	43	BDL	110 E
2,6-dinitrotoluene	BDL	BDL	BDL	BDL
3-nitroaniline	BDL	BDL	BDL	BDL
acenaphthene	900	890	43	1900

^{* -} Also unknown C9 hydrocarbonE - Estimated

BDL - Below Detection Limit

Table - 1 RESULTS OF CHEMICAL ANALYSIS OF U.S. STEEL (GARY STEEL SITE) TAT-COLLECTED SAMPLES

		Sample	Number	
Sample Collection Information and Parameters	LAGOON #1 OUTFALL	LAGOON #2 OUTFALL	DW2	DW4
and ranameters	OUTTALL	OUTTALL		
Semivolatile Organics (Cont)			
2,4-dimethylphenol	15	13	25	BDL
4-nitrophenol	BDL	BDL	BDL	BDL
dibenzofuran	\mathtt{BDL}	BDL	\mathtt{BDL}	BDL
2,4-dinitrotoluene	BDL	BDL	\mathtt{BDL}	BDL
diethylphthalate	\mathtt{BDL}	BDL	\mathtt{BDL}	BDL
4-chlorophenyl-phenylether	BDL	BDL	\mathtt{BDL}	BDL
fluorene	450	460	BDL	1100
4-nitroaniline	\mathtt{BDL}	BDL	\mathtt{BDL}	BDL
4,6-dinitro-2-methylphenol	\mathtt{BDL}	BDL	BDL	BDL
n-nitrosodiphenylamine	BDL	BDL	\mathtt{BDL}	BDL
4-bromophenyl-phenylether	BDL	BDL	\mathtt{BDL}	BDL
hexachlorobenzene	\mathtt{BDL}	BDL	\mathtt{BDL}	BDL
pentachlorophenol	\mathtt{BDL}	BDL	\mathtt{BDL}	\mathtt{BDL}
phenanthrene	110	150	BDL	530
anthracene	30	46	BDL	\mathtt{BDL}
di-n-butylphthalate	BDL	BDL	\mathtt{BDL}	BDL
fluoranthene	8 E	17	11	BDL
pyrene	BDL	14	9	BDL
butylbenzylphthalate	\mathtt{BDL}	BDL	\mathtt{BDL}	BDL
3,3'-dichlorobenzidine	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}	BDL
benzo[a]anthracene	BDL	BDL	BDL	BDL
chrysene	BDL	BDL	BDL	BDL
bis(2-ethylhexyl)phthalate	\mathtt{BDL}	BDL	BDL	BDL
di-n-octylphthalate	\mathtt{BDL}	\mathtt{BDL}	BDL	BDL
benzo[b]fluoranthene	BDL	\mathtt{BDL}	BDL	BDL
benzo[k]fluoranthene	BDL	BDL	BDL	BDL
benzo[a]pyrene	BDL	BDL	BDL	BDL
indeno[1,2,3-cd]pyrene	BDL	BDL	BDL	BDL
dibenzo[a,h]anthracene	\mathtt{BDL}	BDL	BDL	BDL
benzo[g,h,i]perylene	\mathtt{BDL}	BDL	BDL	BDL
pyridine	16 E	13 E	24 E	BDL
carbazole	22	23	BDL	1500
dibenzoturan	640	650		BDL
2-picoline	100	89	55	BDL

^{* -} Also unknown C9 hydrocarbonE - Estimated

BDL - Below Detection Limit

Table - 1 RESULTS OF CHEMICAL ANALYSIS OF U.S. STEEL (GARY STEEL SITE)
TAT-COLLECTED SAMPLES

	Sample Number			
Sample Collection Information and Parameters	LAGOON #1 OUTFALL	LAGOON #2 OUTFALL	DW2	DW4
Analyte Detected (values in mg/L)				
RCRA Metals				
aluminum	BDL	BDL	BDL	BDL
antimony	BDL	\mathtt{BDL}	\mathtt{BDL}	\mathtt{BDL}
arsenic	.032	.033	.032	.021
barium	.11	.11	.058	.051
beryllium	BDL	BDL	\mathtt{BDL}	BDL
cadmium	BDL	BDL	BDL	BDL
calcium	BDL	BDL	BDL	BDL
chromium	BDL	BDL	BDL	BDL
cobalt	BDL	BDL	BDL	BDL
copper	BDL	BDL	BDL	BDL
iron	BDL	BDL	BDL	BDL
lead .	BDL	BDL	BDL	\mathtt{BDL}
magnesium	BDL	BDL	BDL	BDL
manganese	BDL	BDL	BDL	BDL
mercury	BDL	BDL	BDL	BDL
nickel	BDL	BDL	BDL	BDL
potassium	BDL	BDL	BDL	BDL
selenium	BDL	BDL	BDL	BDL
silver	BDL	BDL	BDL	BDL
sodium thallium	BDL	BDL	BDL	BDL
vanadium	BDL BDL	BDL	BDL	BDL
zinc	BDL	BDL	BDL	BDL
cyanide	BDL	BDL	BDL	BDL
Cyaniue	BUL	BDL	BDL	BDL
<pre>Compound Detected (values in mg/L)</pre>				
Total cyanides	.26	.25	.11	.15
pH	7.5	7.5	8.0	7.7
Flammable	211 ^o F	210 ^o F	210 ^o F	210 ^o F
		210 1	210 T	210 F

^{* -} Also unknown C9 hydrocarbonE - EstimatedBDL - Below Detection Limit

Validation Memos



DATE: September 10, 1993

TO: Lee Ende, Project Manager, E&E, Chicago, IL

FROM: Frank C. Dachtler, Chemist, E&E, Cleveland, OH

THRU: Emily S. Landis, Geochemist, E&E, Cleveland, OH $\mathcal{L}^{\mathcal{P}}$

SUBJ: Solvent Scan Data Quality Assurance Review, U.S. Steel

Site, Gary, Lake County, Indiana

REF: Analytical TDD: T059308809 Project TDD: T059308015

Analytical PAN: EIN0218AAA Project PAN: EIN0218VAA

The data quality assurance review of four aqueous samples, taken from U.S. Steel Site on August 13, 1993, is now complete. The samples were submitted to EMS Heritage Laboratories, Inc., of Romeoville, Illinois, which conducted a GC/MS solvent scan, following SW-846 Method 8240.

The samples were labeled:

$\underline{\mathbf{TAT}}$		corresponds to ->	laboratory
lagoon	1	-	C149650
lagoon	2		C149651
DW4			C149652
DW2			C149653

Data Qualifications:

I Holding Time: Acceptable.

The laboratory analyzed samples C149650-651 and -653 were analyzed on August 17, 1993; sample C149652 was analyzed on August 19,1993. This is within the required holding time of 14 days to analysis.

II GC/MS Tuning: Acceptable.

Bromofluorobenzene (BFB) performance standard was analyzed prior to the samples on each day of analysis; all ion abundance criteria were met.

III Initial and Continuing Calibration: Acceptable.

All initial calibration average response factors were greater than zero. The percent relative standard deviations (%RSD) of the response factors in the initial calibration were less than or equal to 30 %RSD, as required.

In the continuing calibration, the percent difference (%D) was less than or equal to 25 %D as required, except for chloromethane (53.83%). No action is required, however, because there were no positive sample results for chloromethane.

- IV Error Determination: Precision and bias not determined.
- V Blanks: Acceptable.

VOA compounds in the method blank were below the instrument detection limits.

VI Compound Identification: Acceptable.

The relative retention times (RRT) of the three compounds detected in the samples were within 0.06 RRT units of the standard, as required. Compounds present in the standard mass spectra are also present in the sample mass spectra. No stray peaks were present.

VII Compound Quantitation/Stated Detection Limits: Acceptable.

Initial sample volume and dilutions were accounted for in the reported results.

- VIII Performance Evaluation Samples: Not Applicable.
- IX Optional QC Checks: Acceptable.

All surrogate percent recoveries (%R) were within the specified limits and had greater than 10 %R.

Overall Assessment:

This data evaluation is based upon the criteria outlined in OSWER Directive 9360.4-01 (1990). With the information provided, the results are considered acceptable for use as reported.



DATE: September 13, 1993

TO: Lee Ende, Project Manager, E&E, Chicago, IL

FROM: Frank C. Dachtler, Chemist, E&E, Cleveland, OH

THRU: Emily S. Landis, Geochemist, E&E, Cleveland, OH

SUBJ: Base-Neutral-Acid Extractable Organics (BNA) Data

Quality Assurance Review, U.S. Steel Site, Gary, Lake

County, Indiana

REF: Analytical TDD: T059308809 Project TDD: T059308015

Analytical PAN: EIN0218AAA Project PAN: EIN0218VAA

The data quality assurance review of four water samples, taken from U.S. Steel Site on August 13, 1993, is now complete. The samples were submitted to EMS Heritage Laboratories, Inc., of Romeoville, Illinois, to be analyzed for Target Compound List (TCL) BNA organic compounds. The laboratory analyzed the samples by gas chromatography/mass spectroscopy (GC/MS) following SW-846 Method 8270.

The samples were labeled:

$\underline{\mathtt{TAT}}$		corresponds to ->	laboratory
lagoon	1		C149650
lagoon	2		C149651
DW4			C149652
DW2			C149653

Data Qualifications:

I Holding Time: Acceptable.

The laboratory analyzed samples C149650-651 and -653 were analyzed on August 17, 1993, and samples C149652 was analyzed on August 19,1993. This is within the required holding time of 7 days to extraction, and 40 days to analysis.

II GC/MS Tuning Criteria: Acceptable.

Decafluorotriphenylphosphine (DFTPP) tuning compound was run within 12 hours of the sample analysis on the same instrument. All ion abundance criteria were met.

III Initial and Continuing Calibration: Acceptable.

All initial and continuing calibration average response factors were greater than zero. The percent relative standard deviations (%RSD), of all BNA compounds were less than or equal to 30 %RSD, as required, except for benzyl alcohol (48.359%). However, there was no positive result for this compound, and therefore no action is taken.

In the continuing calibration, the percent difference (%D) was less than or equal to 25 %D for all BNA compounds except for, benzyl alcohol (64.10%), hexachlorocyclopentadiene (35.59%), toluenediamine (35.24%), 2,4,6-tribromophenol (33.54%), heptachlor (26.82%), dieldrin (25.91%), bis(2-ethylhexyl)phthalate (25.32%), bis(2-chloroethyl)ether (28.42%), 3-nitroaniline (27.88%), and endrin aldehyde (43.98%). No positive results are reported for these compounds, therefore no action is taken. Positive results were found for 2-picoline (34.77%) however, and are flagged "J", as required.

IV Error Determination: Precision and bias not determined.

One matrix spike and a matrix spike duplicate were run, each containing eleven different compounds. All were within the laboratory's QC recovery limits except for 1,4-dichlorobenzene and 1,2,4-trichlorobenzene in the matrix spike, and 1,4-dichlorobenzene, N-nitroso-di-n-propylene, and 1,2,4-trichlorobenzene in the matrix spike duplicate. No action is taken based on only two matrix spikes.

V Blanks: Acceptable.

The method blank contained no BNA compounds above the stated quantitation limits.

VI Compound Identification: Acceptable.

The relative retention times (RRT) of the three compounds detected in the samples were within 0.06 RRT units of the standard, as required. Compounds present in the standard mass spectra are also present in the sample mass spectra. No stray peaks were present.

VII Compound Quantitation/Stated Detection Limits: Acceptable.

Initial sample volume and dilutions were accounted for in

the reported results.

VIII Performance Evaluation Samples: Not Applicable. IX Optional QC Checks: Acceptable.

Surrogate percent recoveries (%R) for samples and blanks were all above the 10% limit, as required.

Overall Assessment:

This data evaluation is based upon the criteria outlined in OSWER Directive 9360.4-01 (1990). With the information provided, the results are considered acceptable for use as reported with the above-stated qualifications.

Data Validation Qualifiers

J The associated numerical value is an estimated quantity because quality control criteria were not met.



DATE: September 14, 1993

TO: Lee Ende, Project Manager, E&E, Chicago, IL

FROM: Frank C. Dachtler, Chemist, E&E, Cleveland, OH

THRU: Emily S. Landis, Geochemist, E&E, Cleveland, OH 43

SUBJ: Inorganic Metals Data Quality Assurance Review, U.S.

Steel Site, Gary, Lake County, Indiana

REF: Analytical TDD: T059308809 Project TDD: T059308015

Analytical PAN: EINO218AAA Project PAN: EINO218VAA

The data quality assurance review of four aqueous samples, taken from U.S. Steel Site on August 13, 1993, is now complete. The samples were submitted to EMS Heritage Laboratories, Inc., of Romeoville, Illinois, to be analyzed for 8 inorganic metals. The laboratory analyzed the sample by: inductively coupled plasma spectroscopy (ICP); graphite furnace atomic absorption (GFAA) for arsenic and selenium; and cold vapor atomic absorption (CVAA) for mercury. The laboratory followed SW-846 Methods 6010 (ICP), SW-846 7000 series (GFAA), and SW-846 7470 (CVAA).

The samples were labeled:

	corresponds to ->	laboratory
1		C149650
2		C149651
		C149652
		C149653
	1 2	1

Data Qualifications:

I Holding Time: Acceptable.

The samples were extracted and analyzed within the 6-month (28 days for mercury) holding time from the date of sample collection, as required.

II Initial and Continuing Calibration: Acceptable.

ICP and GFAA - Each readings for each standard is within 90 to 110% of the mean of 3 readings, as required. The sample was analyzed within 5 samples of a calibration standard or blank, as required.

CVAA - Each reading was within 80 - 120% of the mean of 3 readings for each standard, as required.

III Blanks: Acceptable.

The concentrations of all blanks falls below the detection limits for all parameters.

IV ICP Interference Check Sample: Acceptable.

All interference check sample results are within the control limits, indicating that instrument interferences were not present.

V Error Determination: Not Applicable.

Precision and bias were not determined for these samples. However, matrix spike and matrix spike duplicate samples were analyzed for each method used. The percent recovery (%R) for each analyte was within 80 to 120%, as required.

VI Performance Evaluation Samples: Not Applicable.

VII Optional QC Checks: Acceptable.

ICP Serial Dilutions - Serial dilutions were not required, except for barium, because sample concentrations exceeded 50 times the instrument detection limit (IDL). The diluted sample agreed within 10% of original determination for the parameter, as required.

Overall Assessment:

This data evaluation is based upon the criteria outlined in OSWER Directive 9360.4-01 (1990). With the information provided, the results are considered acceptable for use as reported.



DATE: September 14, 1993

TO: Lee Ende, Project Manager, E&E, Chicago, IL

FROM: Frank C. Dachtler, Chemist, E&E, Cleveland, OH,

THRU: Emily S. Landis, Geochemist, E&E, Cleveland, OH

SUBJ: Reactive Sulfides Data Quality Assurance Review, U.S.

Steel Site, Gary, Lake County, Indiana

REF: Analytical TDD: T059308809 Project TDD: T059308015

Analytical PAN: EIN0218AAA Project PAN: EIN0218VAA

The data quality assurance review of four aqueous samples, taken from U.S. Steel Site on August 13, 1993, is now complete. The samples were submitted to EMS Heritage Laboratories, Inc., of Romeoville, Illinois, and analyzed for reactive sulfides according to SW-846 Method 9030.

The samples were labeled:

$\underline{\mathbf{TAT}}$	corresponds to ->	laboratory
lagoon 1	<u>-</u>	C149650
lagoon 2	2	C149651
DW4		C149652
DW2		C149653

Data Qualifications:

I Holding Time: Acceptable.

The samples were analyzed within 14 days from the time of collection, as required.

II Instrument Calibration: Acceptable.

A blank and five standards were analyzed. All results are within 90 - 110% of the mean value.

III Method Blank: Acceptable.

The method blank contained no sulfides above the detection limit.

IV Error Determination: Acceptable.

The percent recoveries (%R) of the spiked replicates was within the 80 - 120% limits, as required.

V Performance Evaluation Samples: Not Applicable.

Overall Assessment:

This data evaluation is based upon the guidelines set forth in the OSWER Directive 9360.4-01 (1990). With the information provided, the results may be considered acceptable for use a reported.



DATE: September 14, 1993

TO: Lee Ende, Project Manager, E&E, Chicago, IL

FROM: Frank C. Dachtler, Chemist, E&E, Cleveland, OH

THRU: Emily S. Landis, Geochemist, E&E, Cleveland, OH

SUBJ: Total Cyanide Data Quality Assurance Review, U.S.

Steel Site, Gary, Lake County, Indiana

REF: Analytical TDD: T059308809 Project TDD: T059308015

Analytical PAN: EIN0218AAA Project PAN: EIN0218VAA

The data quality assurance review of four aqueous samples, taken from U.S. Steel Site on August 13, 1993, is now complete. The samples were submitted to EMS Heritage Laboratories, Inc., of Romeoville, Illinois, which analyzed the sample for total and amenable cyanide according to SW-846 Method 9010.

The samples were labeled:

$\overline{ extbf{T}}$		corresponds to ->	laboratory
lagoon	1	-	C149650
lagoon	2		C149651
DW4			C149652
DW2			C149653

Data Qualifications:

I Holding Time: Acceptable.

The samples were analyzed within the 14 day holding time limit, as required.

II Instrument Calibration: Acceptable.

A blank and six standards were analyzed. The correlation coefficient was greater than 0.995, as required.

III Method Blank: Acceptable.

The method blank contained no cyanide above the detection limit.

IV Additional QC Checks: Acceptable.

The matrix spike result was within 20% of the spiked value, indicating that matrix interferences were not present.

Overall Assessment:

This data evaluation is based upon the criteria outlined in OSWER Directive 9360.4-01 (1990). With the information provided, the results are considered acceptable for use as reported.



DATE: September 14, 1993

TO: Lee Ende, Project Manager, E&E, Chicago, IL

FROM: Frank C. Dachtler, Chemist, E&E, Cleveland, OH

THRU: Emily S. Landis, Geochemist, E&E, Cleveland, OH $\hat{\ell}^{\frac{1}{2}}$

SUBJ: pH and Flammability Data Review, U.S. Steel Site, Gary,

Lake County, Indiana

REF: Analytical TDD: T059308809 Project TDD: T059308015

Analytical PAN: EIN0218AAA Project PAN: EIN0218VAA

The data quality assurance review of four aqueous samples, taken from U.S. Steel Site on August 13, 1993, is now complete. The samples were submitted to EMS Heritage Laboratories, Inc., of Romeoville, Illinois, and tested for pH by SW-846 Method 9040, and flashpoint according to SW-846 Method 1010.

The samples were labeled:

$\underline{\mathbf{T}}\mathbf{A}\underline{\mathbf{T}}$		corresponds to ->	laboratory
lagoon	1		C149650
lagoon	2		C149651
DW4			C149652
DW2			C149653

Data Qualifications:

I Holding Time: Not Applicable.

II Calibrations: Acceptable.

pH - The pH meter was calibrated with buffer solutions of 7, 4, and 10 pH. The calibration results were within 10% of the true value.

Flashpoint - The Pensky-Martens Closed-Cup Flashpoint Tester was adequately checked with para-xylene just prior to testing the samples.

Overall Assessment:

There are no specific guidelines in OSWER Directive 9360.4-01 for the evaluation of flashpoint data. However, with the information provided, it is the reviewers professional judgement that the results are acceptable for use as reported.

CERTIFICATE OF ANALYSIS

Service Location HERITAGE LABORATORIES, INC.	Received 16-AUG-93	Project	Lab ID C149650
1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441	Complete 30-AUG-93	PO N VER	umber BAL
(708)378-1600	Printed	Samp	led
	31-AUG-93	13-AUG-	93

Report To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130 Bill To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130

Sample Description

DESCRIPTION: LAGOON 1 OUTFALL

Analyst: L. DIAZ Analysis Date: 17-AUG-	-93 11:20 Instrument: GC/MS VOA	Test: 0	Test: 0510.3.0	
Parameter	Result	Det. Limit	Units	
ACETONE	BDL	100	ug/L	
ACROLEIN	BDL	250	ug/L	
ACRYLONITRILE	BDL	350	ug/L	
BENZENE	590	25	ug/L	
BROMODICHLOROMETHANE	BDL	25	ug/L	
BROMOFORM) BDL	25	ug/L	
BROMOMETHANE	BDL	50	ug/L	
CARBON DISULFIDE	BDL	25	ug/L	
CARBON TETRACHLORIDE	BDL	25	ug/L	
CHLOROBENZENE	BDL	25	ug/L	
CHLOROETHANE	BDL	50	ug/L	
CHLOROFORM	BDL	25	ug/L	
CHLOROMETHANE	BDL	50	ug/L	
DIBROMOCHLOROMETHANE	BDL	25	ug/L	
CIS-1,3-DICHLOROPROPENE	BDL	25	ug/L	
DICHLORODIFLUOROMETHANE	BDL	25	ug/L	
1,1-DICHLOROETHANE	BDL	25	ug/L ug/L	
1,2-DICHLOROETHANE	BDL	25	ug/L ug/L	
1,1-DICHLOROETHENE	BDL	25	ug/L ug/L	
1,2-DICHLOROPROPANE	BDL	25	ug/L ug/L	
ETHYLBENZENE	34	25	ug/L ug/L	
FLUOROTRICHLOROMETHANE	BDL	25		
2-HEXANONE	BDL	50	ug/L	
METHYLENE CHLORIDE	BDL	25	ug/L	
METHYL ETHYL KETONE	BDL		ug/L	
4-METHYL-2-PENTANONE	BDL	50	ug/L	
STYRENE		50	ug/L	
1,1,2,2-TETRACHLOROETHANE	BDL	25	ug/L	
TETRACHLOROETHENE	BDL	25	ug/L	
TETRAHYDROFURAN	BDL	25	ug/L	
	BDL	120	ug/L	
TOLUENE	51	25	ug/L	
1,2-DICHLOROETHENE (TOTAL)	BDL	25	ug/L	
TRANS-1,3-DICHLOROPROPENE	BDL	25	ug/L	
1,1,1-TRICHLOROETHANE	BDL	25	ug/L	
1,1,2-TRICHLOROETHANE	BDL	25	ug/L	

Page 1 (continued on next page)

Lab Sample ID: C149650

HERITAGE LABORATORIES, INC.

Parameter	Result	Det. Limit	Units
TRICHLOROETHENE	BDL	25	ug/L
VINYL ACETATE	BDL	50	ug/L
VINYL CHLORIDE	BDL	50	ug/L
XYLENE (TOTAL)	140	25	ug/L
ALSO DETECTED			
UNKNOWN C9 HYDROCARBON	EST 140 RT=34.8		
SURROGATE RECOVERY			
DICHLOROETHANE-D4	104		% Rec
TOLUENE-D8	100		% Rec
BROMOFLUOROBENZENE	102		% Rec
SAMPLE WAS ANALYZED AT A 1:5 DILUTION.			<u> </u>

GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A Analyst: H. QIAN Analysis Date: 17-AUG-93 Test: P233.4.0				
Parameter	Result	Det. Limit	Units	
INITIAL WEIGHT OR VOLUME	1000		mL	
FINAL VOLUME	1		mL	

SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A Analyst: H. QIAN Analysis Date: 17-AUG-93 16:51 Instrument: GC/MS SVOA Test: 0505.3.0 Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A P233.4.0					
Parameter	Result	Det. Limit	Units		
ACENAPHTHENE	*	10	ug/L		
ACENAPHTHYLENE	42	10	ug/L		
ANTHRACENE	30	10	ug/L		
BENZ(A)ANTHRACENE	BDL	10	ug/L		
BENZÒ(Á)PYRENE	BDL	10	ug/L		
BENZO(B)FLUORANTHENE	BDL	10	ug/L		
BENZO(G,H,I)PERYLENE	BDL	10	ug/L		
BENZO(K)FLUÓRANTHENE	BDL	10	ug/L		
BENZYL ALCOHOL	BDL	10	ug/L		
BENZYLBUTYLPHTHALATE	BDL	10	ug/L		
BIS(2-CHLOROETHOXY)METHANE	BDL	10	ug/L		
BIS(2-CHLOROETHYL)ÉTHER	BDL	10	ug/L		
BIS(2-CHLOROISOPRÓPYL)ETHER	BDL	10	ug/L		
BIS(2-ETHYLHEXYL)PHTHÁLATE	BDL	10	ug/L		
4-BROMOPHENYLPHENYLETHER	BDL	10	ug/L		
CARBAZOLE	22	10	ug/L		
4-CHLOROANILINE	BDL	10	ug/L		
2-CHLORONAPHTHALENE	BDL	10	ug/L		
4-CHLOROPHENYLPHENYLETHER	BDL	10	ug/L		
CHRYSENE	BDL	10	ug/L		
DIBENZ(A,H)ANTHRACENE	BDL	10	ug/L		
DIBENZOFURAN	*	10	ug/L		
1,2-DICHLOROBENZENE	BDL	10	ug/L		
1,3-DICHLOROBENZENE	BDL	10	ug/L		
1,4-DICHLOROBENZENE	BDL	10	ug/L		
3,3'-DICHLOROBENZIDINE	BDL	20	ug/L		
DIETHYLPHTHALATE	BDL	10	ug/L		
DIMETHYLPHTHALATE	BDL	10	ug/L		
DI-N-BUTYLPHTHALATE	BDL	10	ug/L		
DINITROBENZENES	BDL	50	ug/L		
2,4-DINITROTOLUENE	BDL	10	ug/L		
2,6-DINITROTOLUENE	BDL	10	ug/L		

Parameter	Result	Det. Limit Units
DI-N-OCTYLPHTHALATE	BDL	10 ug/L
FLUORANTHENE	EST 8	10 ug/L
	*	10 ug/L
FLUORENE	BDL	10 ug/L
HEXACHLOROBENZENE	BDL	10 ug/L
HEXACHLOROBUTADIENE		1
HEXACHLOROCYCLOPENTADIENE	BDL	,
HEXACHLOROETHANE	BDL	10 ug/L
INDENO(1,2,3-CD)PYRENE	BDL	10 ug/L
ISOPHORONE	BDL *	10 ug/L
2-METHYLNAPHTHALENE	*	10 ug/L
NAPHTHALENE	1	10 ug/L
2-NITROANILINE	BDL	50 ug/L
3-NITROANILINE	BDL	50 ug/L
4-NITROANILINE	BDL	50 ug/L
NITROBENZENE	BDL	10 ug/L
N-NITROSO-DIPHENYLAMINE	BDL	10 ug/L
N-NITROSO-DI-N-PROPYLAMINE	BDL	10 ug/L
PHENANTHRENE	110	10 ug/L
2-PICOLINE	100	50 ug/L
PYRENE	BDL	10 ug/L
PYRIDINE	EST 16	50 ug/L
TETRACHLOROBENZENES	BDL	10 ug/L
TOLUENEDIAMINE	BDL	50 ug/L
1,2,4-TRICHLOROBENZENE	BDL	10 ug/L
BENZOIC ACID	BDL	50 ug/L
4-CHLORO-3-METHYLPHENOL	BDL	10 ug/L
	BDL	1
2-CHLOROPHENOL	BDL	1 0.
2,4-DICHLOROPHENOL		, 5,
2,4-DIMETHYLPHENOL	15	10 ug/L
4,6-DINITRO-2-METHYLPHENOL	BDL	50 ug/L
2,4-DINITROPHENOL	BDL	50 ug/L
2-METHYLPHENOL	41	10 ug/L
4-METHYLPHENOL	BDL	10 ug/L
2-NITROPHENOL	BDL	10 ug/L
4-NITROPHENOL	BDL	50 ug/L
PENTACHLOROPHENOL	BDL	50 ug/L
PHENOL	16	10 ug/L
TETRACHLOROPHENOL	BDL	10 ug/L
2,4,5-TRICHLOROPHENOL	BDL	50 ug/L
2,4,6-TRICHLOROPHENOL	BDL	10 ug/L
SURROGATE RECOVERY		
2-FLUOROPHENOL	F1	
PHENOL-D5	51	1
NITROBENZENE-D5	52	
2-FLUOROBIPHENYL	73	
2,4,6-TRIBROMOPHENOL	110	
4,7,UTIKIDKUMUPRENUL	140	1
TERPHENYL-D14	100	1

INSUFFICIENT SAMPLE TO USE AS QC

Analyst: H. QIAN Analysis Date: 18-AUG-93 18:20 In Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510	ONS) SW846-8270A strument: GC/MS SVOA NA P233.4.0	Test: 05	05.3.1
Parameter ACENAPHTHENE DIBENZOFURAN FLUORENE 2-METHYLNAPHTHALENE NAPHTHALENE	Result 900 640 450 500 370	Det. Limit 100 100 100 100 100	Units ug/L ug/L ug/L ug/L ug/L ug/L
SURROGATE RECOVERY			
2-FLUOROPHENOL PHENOL-D5 NITROBENZENE-D5 2-FLUOROBIPHENYL	* * *		
2,4,6-TRIBROMOPHENOL TERPHENYL-D14 * SURROGATES DILUTED OUT.	*		
CYANIDE AMENABLE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 26-AUG-93		Test: P111.	4.0
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 250 250	Det. Limit	Units mL mL
CYANIDE, AMENABLE TO CHLORINATION (MANUAL) SW846 Analyst: J. MATTEI Analysis Date: 27-AUG-93 Prep: CYANIDE AMENABLE DISTILLATION SW846-9010A P111.4.0	5-9010 A	Test: G119.	6.0
Parameter CYANIDE, AMENABLE	Result	Det. Limit	Units
			mg/L
CYANIDE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 18-AUG-93		Test: P101.	
	Result 250 250	Test: P101.	
Analyst: J. MATTEI Analysis Date: 18-AUG-93 Parameter INITIAL WEIGHT OR VOLUME	250		4.0 Units mL mL
Analyst: J. MATTEI Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Analysis Date: 20-AUG-93	250	Det. Limit	4.0 Units mL mL
Analyst: J. MATTEI Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Analysis Date: 20-AUG-93 Prep: CYANIDE DISTILLATION SW846-9010A P101.4.0 Parameter CYANIDE PH (AQUEOUS) SW846-9040	250 250 Result	Test: G119. Det. Limit .01	Units mL mL 5.0 Units mg/L
Analyst: J. MATTEI Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Prep: CYANIDE DISTILLATION SW846-9010A P101.4.0 Parameter CYANIDE PH (AQUEOUS) SW846-9040 Analyst: C. QUARLES Analysis Date: 17-AUG-93 Parameter	250 250 Result	Det. Limit Test: G119. Det. Limit .01 Test: G607. Det. Limit	Units mL mL 5.0 Units mg/L 5.0 Units
Analyst: J. MATTEI Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Analysis Date: 20-AUG-93 Prep: CYANIDE DISTILLATION SW846-9010A P101.4.0 Parameter CYANIDE PH (AQUEOUS) SW846-9040 Analyst: C. QUARLES Analysis Date: 17-AUG-93	250 250 Result .26	Test: G119. Det. Limit .01 Test: G607.	Units mL mL 5.0 Units mg/L 5.0 Units mg/L 5.0 Units

BARIUM ICP SW846-6010A		Lab Sample ID: C149650
Analyst: M. JAO Analysis Date: 24-AUG-93 09:	00 Instrument: ICP	Test: M104.3.0 IND
Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30		
Parameter	Result	Det. Limit Units
BARIUM	0.11	0.010 mg/L
CADMIUM ICP SW846-6010A		
Analyst: M. JAO Analysis Date: 26-AUG-93 08:		Test: M108.3.0 IND
Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30	005A P130.4.1	
Parameter	Result	Det Limit Units
CADMIUM	BDL	0.0050 mg/L
CHROMIUM ICP SW846-6010A		
Analyst: M. JAO Analysis Date: 24-AUG-93 09:		Test: M110.3.0 IND
Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30	005A P130.4.1	
Parameter	Result	Det. Limit Units
CHROMIUM	BDL	0.010 mg/L
		
LEAD ICP SW846-6010A		
Analyst: M. JAO Analysis Date: 24-AUG-93 09:		Test: M116.3.0 INC
Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3	JUSA P130.4.1	
Parameter	Result	Det. Limit Units
LEAD	BDL	0.050 mg/L
Analyst: M. JAO Analysis Date: 24-AUG-93 09: Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3		
Parameter CIIVFD	Result	Det. Limit Units
Parameter SILVER		Det. Limit Units 0.010 mg/L
SILVER	Result BDL	1
SILVER GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84	Result BDL	0.010 mg/L
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93	BDL Result	0.010 mg/L Test: P130.6.0
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter	Result BDL Result	0.010 mg/L Test: P130.6.0 Det. Limit Units
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME	BDL Result	0.010 mg/L Test: P130.6.0 Det. Limit Units mL
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93	Result 6-3020A Result 50	0.010 mg/L Test: P130.6.0 Det. Limit Units
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME	Result 6-3020A Result 50	0.010 mg/L Test: P130.6.0 Det. Limit Units mL
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME	Result 6-3020A Result 50	0.010 mg/L Test: P130.6.0 Det. Limit Units mL
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060	Result BDL 6-3020A Result 50 50 Instrument: GFAA	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P	Result BDL 6-3020A Result 50 50 Instrument: GFAA 130.6.0 Result	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P	Result BDL 6-3020A Result 50 50 Instrument: GFAA	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC	Result BDL 6-3020A Result 50 50 Instrument: GFAA 130.6.0 Result	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0 Det. Limit Units
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC SELENIUM GFAA SW846-7740	Result BDL Result 50 50 1nstrument: GFAA 130.6.0 Result .032	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0 Det. Limit Units
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93	Result BDL Result 50 50 10.6.0 Result .032 Result .032	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0 Det. Limit Units
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC SELENIUM GFAA SW846-7740	Result BDL Result 50 50 10.6.0 Result .032 Result .032	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0 Det. Limit Units .010 mg/L
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter	Result BDL 6-3020A Result 50 50 Instrument: GFAA 130.6.0 Result .032	O.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0 Det. Limit Units .010 mg/L
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter SELENIUM Parameter	Result BDL 6-3020A Result 50 50 Instrument: GFAA 130.6.0 Result .032	0.010 mg/L Test: P130.6.0 Det. Limit Units mL mL Test: M103.2.0 Det. Limit Units .010 mg/L Test: M128.2.0
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW84 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P Parameter	Result BDL 6-3020A Result 50 50 Instrument: GFAA 130.6.0 Result .032	0.010 mg/L

Analyst: A. ROBERTSON Analysis Date: 18-AUG-93		Test: P131.	6.0 INDI
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 100 100	Det. Limit	Units mL mL

Lab Sample ID: C149650

MERCURY CVAA SW846-7470 Analyst: A. ROBERTSON Analysis Date: 19-AUG-93 Instrument: CVAA Test: M120.1.0 INDI Prep: MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-7470 P131.6.0				
Parameter MERCURY	Result	Det. Limit	Units	
	BDL	0.00050	mg/L	

FLASH POINT BY PENSKY-MARTENS CLOSED TESTER ASTM D-93 Analyst: L. RYBSKI Analysis Date: 18-AUG-93 Test: G509.9.0			
Parameter	Result	Det. Limit	Units
FLASH POINT	* 211		Degrees F
BOILED AT 211 DEGREES			

TOTAL AVAILABLE SULFIDE EXTRACTION SW 7.3.4.1 Analyst: L. RYBSKI Analysis Date: 17-AUG-93 Test: P116.2.0			
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	250		mL
FINAL VOLUME	250		mL

SULFIDE SW846-9030A Analyst: L. RYBSKI	Analysis Date: 17-AUG-93		Test: G110.4.	0
SULFIDE	Parameter	Result BDL	Det. Limit	Units mg/L

CYANIDE, TOTAL AVAILABLE (MANUAL) SW 7.3.3.2 Analyst: J. MATTEI Analysis Date: 20-AUG-93		Test: G115.1.0
Parameter CYANIDE	Result BDL	Det. Limit Units .01 mq/L

Sample Comments

* See Note for Parameter BDL Below Detection Limit EST Estimated Value RT Retention Time

Sample chain of custody number 5-04314.

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9-1-93

Quality Assurance Officer:

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CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE LABORATORIES, INC. 1319 MARQUETTE DRIVE	16-AUG-93		C149651
	Complete	PO Number	
	30-AUG-93	VER	BAL
(708)378-1600	Printed	Samp	led
	31-AUG-93	13-AUG-	93

Report To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130 Bill To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130

Sample Description

DESCRIPTION: LAGOON 2 OUTFALL

<u> </u>	73 14:31 Instrument: GC/MS VOA	Test: 0	
Parameter ACETONE	Result BDL	Det. Limit 100	Units
ACROLEIN	BDL	250	ug/L ug/L
ACRYLONITRILE	BDL	350	ug/L ug/L
BENZENE	580	25	ug/L ug/L
BROMODICHLOROMETHANE	BDL	25	
BROMOFORM	BDL	25	ug/L
BROMOMETHANE	BDL	50	ug/L ug/L
CARBON DISULFIDE	BDL	25	ug/L ug/L
CARBON TETRACHLORIDE	BDL	25	ug/L ug/L
CHLOROBENZENE	BDL	25	ug/L ug/L
CHLOROETHANE	BDL	50	ug/L ug/L
CHLOROFORM	BDL	25	ug/L ug/L
CHLOROMETHANE	BDL	50	ug/L ug/L
DIBROMOCHLOROMETHANE	BDL	25	ug/L ug/L
CIS-1,3-DICHLOROPROPENE	BDL	25	ug/L ug/L
DICHLORODIFLUOROMETHANE	BDL	25	
1,1-DICHLOROETHANE	BDL	25	ug/L ug/L
1,2-DICHLOROETHANE	BDL	25	ug/L ug/L
1,1-DICHLOROETHENE	BDL	25	ug/L ug/L
1,2-DICHLOROPROPANE	BDL	25	ug/L ug/L
ETHYLBENZENE	32	25	ug/L ug/L
FLUOROTRICHLOROMETHANE	BDL	25	ug/L ug/L
2-HEXANONE	BDL	50	ug/L ug/L
METHYLENE CHLORIDE	BDL	25	ug/L ug/L
METHYL ETHYL KETONE	BDL	50	ug/L ug/L
4-METHYL-2-PENTANONE	BDL	50	ug/L ug/L
STYRENE	BDL	25	ug/L
1,1,2,2-TETRACHLOROETHANE	BDL	25	
TETRACHLOROETHENE	BDL	25	ug/L
TETRAHYDROFURAN	BDL	120	ug/L ug/L
TOLUENE	49	25	3,
1,2-DICHLOROETHENE (TOTAL)	BDL		ug/L
FRANS-1,3-DICHLOROPROPENE	BDL	25	ug/L
1,1,1-TRICHLOROETHANE	BDL	25	ug/L
1,1,2-TRICHLOROETHANE	BDL	25 25	ug/L ug/L

Page 1 (continued on next page)

HERITAGE LABORATORIES, INC.

Lab Sample ID: C149651

Result	Det. Limit	Units
BDL	25	ug/L
BDL	50	ug/L
BDL	50	ug/L
140	25	ug/L
EST 130 RT=34.8		
96		% Rec
I		% Rec
l l		% Rec
	BDL BDL BDL 140	BDL 25 BDL 50 BDL 140 25 EST 130 RT=34.8

GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTR	RACTION SW846-3510A		
Analyst: H. QIAN Analysis Date: 17-AUG-93		Test: P233	.4.0
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1000		mL
FINAL VOLUME	1		mL

SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/AC Analyst: H. QIAN Analysis Date: 17-AUG- Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION	93 17:45 Instrument: GC/MS SVOA	Test: 0	505.3.0
Parameter	Result	Det. Limit	Units
ACENAPHTHENE	*	10	ug/L
ACENAPHTHYLENE	43	10	ug/L ug/L
ANTHRACENE	46	10	ug/L
BENZ(A)ANTHRACENE	BDL	10	ug/L
BENZO(A) PYRENE	BDL	10	ug/L
BENZO(B) FLUORANTHENE	BDL	10	ug/L
BENZO(G,H,I)PERYLENE	BDL	10	ug/L ug/L
BENZO(K) FLUORANTHENE	BDL	10	ug/L
BENZYL ALCOHOL	BDL	10	ug/L
BENZYLBUTYLPHTHALATE	BDL	10	ug/L
BIS(2-CHLOROETHOXY)METHANE	BDL	10	ug/L
BIS(2-CHLOROETHYL)ÉTHER	BDL	10	ug/L
BIS(2-CHLOROISOPROPYL)ETHER	BDL	10	ug/L
BIS(2-ETHYLHEXYL)PHTHÁLATE	BDL	10	ug/L
4-BROMOPHENYLPHENYLETHER	BDL	10	ug/L
CARBAZOLE	23	10	ug/L
4-CHLOROANILINE	BDL	10	ug/L
2-CHLORONAPHTHALENE	BDL	10	ug/L
4-CHLOROPHENYLPHENYLETHER	BDL	10	ug/L
CHRYSENE	BDL	10	ug/L
DIBENZ(A, H) ANTHRACENE	BDL	10	ug/L
DIBENZOFURAN	*	10	ug/L
1,2-DICHLOROBENZENE	BDL	10	ug/L
1,3-DICHLOROBENZENE	BDL	10	ug/L
1,4-DICHLOROBENZENE	BDL	10	ug/L
3,3'-DICHLOROBENZIDINE	BDL	20	ug/L
DIETHYLPHTHALATE	BDL	10	ug/L
DIMETHYLPHTHALATE	BDL	10	ug/L
DI-N-BUTYLPHTHALATE	BDL	10	ug/L
DINITROBENZENES	BDL	50	ug/L
2,4-DINITROTOLUENE	BDL	10	ug/L
2,6-DINITROTOLUENE	BDL	10	ug/L
DI-N-OCTYLPHTHALATE	BDL	10	ug/L
FLUORANTHENE	17	10	ug/L

Page 2 (continued on next page)

HERITAGE LABORATORIES, INC.		: 6149651	
Parameter	Result	Det. Limit	Units
FLUORENE	*	10	ug/L
HEXACHLOROBENZENE	BDL	10	ug/L
HEXACHLOROBUTADIENE	BDL	10	ug/L
HEXACHLOROCYCLOPENTADIENE	BDL	10	, <i>o,</i>
HEXACHLOROETHANE	BDL	10	ug/L
INDENO(1,2,3-CD)PYRENE	BDL	10	ug/L
ISOPHORONE	BDL	10	ug/L
2-METHYLNAPHTHALENE	*	10	ug/L
NAPHTHALENE	120	10	ug/L
2-NITROANILINE	BDL	50	ug/L
3-NITROANILINE	BDL	50	ug/L
4-NITROANILINE	BDL	50	ug/L
NITROBENZENE	BDL	10	ug/L
N-NITROSO-DIPHENYLAMINE	BDL	10	ug/L
N-NITROSO-DI-N-PROPYLAMINE	BDL	10	ug/L
PHENANTHRENE	150	10	ug/L
2-PICOLINE	89	50	ug/L ug/L
PYRENE	14	10	ug/L
PYRIDINE	EST 13	50	ug/L
TETRACHLOROBENZENES	BDL	10	ug/L
TOLUENEDIAMINE	BDL	50	ug/L
1,2,4-TRICHLOROBENZENE	BDL	10	•
BENZOIC ACID	BDL	50	ug/L
4-CHLORO-3-METHYLPHENOL	BDL	10	_ ·
2-CHLOROPHENOL	BDL	10	ug/L
2,4-DICHLOROPHENOL	BDL	10	ug/L
2,4-DIMETHYLPHENOL	13	10	ug/L
4,6-DINITRO-2-METHYLPHENOL	BDL	50	ug/L
2,4-DINITROPHENOL	BDL	50	ug/L
2-METHYLPHENOL	37	10	ug/L
4-METHYLPHENOL	BDL	10	ug/L
2-NITROPHENOL	BDL	10	ug/L
4-NITROPHENOL	BDL	50	ug/L
PENTACHLOROPHENOL	BDL	50	ug/L
PHENOL	15		ug/L
TETRACHLOROPHENOL	BDL	10	ug/L
2,4,5-TRICHLOROPHENOL	BDL	50	ug/L ug/L
2,4,6-TRICHLOROPHENOL	BDL	10	
	BBE	10	ug/L
SURROGATE RECOVERY			
2-FLUOROPHENOL	47		
PHENOL-D5	49		
NITROBENZENE-D5	63	}	}
2-FLUOROBIPHENYL	120		}
2,4,6-TRIBROMOPHENOL	140		
TERPHENYL-D14	120		
Concentration is out if calibration range. Sample	will be diluted and		L
reanalyzed.	wiii be uiluteu and		

SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FI Analyst: H. QIAN Analysis Date: 18-AUG-93 19: Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW84	15 Instrument: GC/MS SVOA	Test: 0	505.3.1
Parameter ACENAPHTHENE DIBENZOFURAN FLUORENE 2-METHYLNAPHTHALENE . SURROGATE RECOVERY	Result 890 650 460 410	Det. Limit 100 100 100 100	ug/L ug/L
2-FLUOROPHENOL PHENOL-D5 NITROBENZENE-D5 2-FLUOROBIPHENYL 2,4,6-TRIBROMOPHENOL TERPHENYL-D14	* * * * * * *		
* SURROGATES DILUTED OUT.			
CYANIDE AMENABLE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 26-AUG-93		Test: P111.	4.0
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 250 250	Det. Limit	Units mL mL
CYANIDE, AMENABLE TO CHLORINATION (MANUAL) Analyst: J. MATTEI Analysis Date: 27-AUG-93 Prep: CYANIDE AMENABLE DISTILLATION SW846-9010A P111.4.0	SW846-9010A	- Test: G119.	6.0
Parameter CYANIDE, AMENABLE	Result	Det. Limit	Units mq/L

CTARTOL, AITERABLE			IIIg/ L
CYANIDE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 18-AUG-93	Test: P101.4.0		
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	250		mL
FINAL VOLUME	250		mL

CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Analysis Date: 20-AUG-93 Prep: CYANIDE DISTILLATION SW846-9010A P101.4.0		Test: G119.5.0
Parameter CYANIDE	Result	Det. Limit Units .01 mg/L

PH (AQUEOUS) SW846-	9040			
Analyst: C. QUARLES	Analysis Date: 17-AUG-93		Test: G607.	5.0
	Parameter	Result	Det. Limit	Units
PH		7.5	0.1	Std. Units

FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLE Analyst: S. CARDWELL Analysis Date: 20-AUG-93	S SW846-3005A	Test: P130.	4.1 INDI
Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME	Result 50 50	Det. Limit	Units mL mL
INSUFFICIENT SAMPLE TO USE AS QC			

HERITAGE LABORATORIES, INC.		Lab Sample ID: C149651
BARIUM ICP SW846-6010A Analyst: M. JAO Analysis Date: 24-AUG-93 09:00 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-300		Test: M104.3.0 INDI
Parameter BARIUM	Result 0.11	Det. Limit Units 0.010 mg/L
CADMIUM ICP SW846-6010A Analyst: M. JAO Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-300		Test: M108.3.0 INDI
Parameter CADMIUM	Result BDL	Det. Limit Units 0.0050 mg/L
CHROMIUM ICP SW846-6010A Analyst: M. JAO Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-300		Test: M110.3.0 INDI
Parameter CHROMIUM	Result BDL	Det. Limit Units 0.010 mg/L
LEAD ICP SW846-6010A Analyst: M. JAO Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-300		Test: M116.3.0 INDI
Parameter LEAD	Result BDL	Det. Limit Units 0.050 mg/L
SILVER ICP SW846-6010A Analyst: M. JAO Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-300		Test: M130.3.0 INDI
Parameter SILVER	Result BDL	Det. Limit Units 0.010 mg/L
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846 Analyst: J. ULASZEK Analysis Date: 17-AUG-93	-3020A	Test: P130.6.0
Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME	Result 50 50	Det. Limit Units ML ML
ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 II Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P13		Test: M103.2.0
Parameter ARSENIC	Result	Det. Limit Units .010 mg/L
SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 25-AUG-93 II Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P13	nstrument: GFAA	Test: M128.2.0
Parameter SELENIUM	Result BDL	Det. Limit Units .020 mg/L
MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLI Analyst: A. ROBERTSON Analysis Date: 18-AUG-93	ES SW846-7470	Test: P131.6.0 INDI
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 100 100	Det. Limit Units mL mL

MERCURY CVAA SW846-7470 Analyst: A. ROBERTSON Analysis Date: 19-AUG-93 II Prep: MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-7		Test: M120.1.0 INDI
Parameter MERCURY	Result BDL	Det. Limit Units 0.00050 mg/L

FLASH POINT BY PENSKY-MARTENS CLOSED TESTER ASTM Analyst: L. RYBSKI Analysis Date: 18-AUG-93	D-93	Test: G509	.9.0
Parameter	Result	Det. Limit	Units
FLASH POINT	* 210		Degrees F
BOILED AT 210 DEGREES			

TOTAL AVAILABLE SULFIDE EXTRACTION SW 7.3.4.1 Analyst: L. RYBSKI Analysis Date: 17-AUG-93		Test: P116	.2.0
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	250		mL.
FINAL VOLUME	250		mL

SULFIDE SW846-9030A Analysi: L. RYBSKI Analysis Date: 17-AUG-93		Test: G110.4.0
Parameter SULFIDE	Result BDL	Det. Limit Units 4 mg/L

CYANIDE, TOTAL AVAILABLE (MANUAL) SW 7.3.3.2 Analyst: J. MATTEI Analysis Date: 20-AUG-93		Test: G115.1.0
Parameter CYANIDE	Result BDL	Det. Limit Units .01 mg/L

Sample Comments

* See Note for Parameter

BDL Below Detection Limit

EST Estimated Value RT Retention Time

Sample chain of custody number 5-04314.

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9-1-93

Quality Assurance Officer:



CERTIFICATE OF ANALYSIS

Service Location	Received	Project	Lab ID
HERITAGE LABORATORIES, INC.	16-AUG-93		C149653
1319 MARQUETTE DRIVE ROMEOVILLE, IL 60441	Complete	PO N	lumber
	30-AUG-93	VER	BAL
(708)378-1600	Printed	Samp	ol ed
	31-AUG-93	13-AUG-	93

Report To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130 Bill To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130

DESCRIPTION: DW 2-WELL BY SUBSTATION 5

VOLATILE ORGANICS SW846-8240A			
Analyst: L. DIAZ Analysis Date: 17-AUG-93 13:37 1	nstrument: GC/MS VOA	Test: 0	1
Parameter	Result	Det. Limit	Units
ACETONE	BDL	100	ug/L
ACROLEIN	BDL	250	ug/L
ACRYLONITRILE	BDL	350	ug/L
BENZENE	*	25	ug/L
BROMODICHLOROMETHANE	BDL	25	ug/L
BROMOFORM	BDL	25	ug/L
BROMOMETHANE	BDL	50	ug/L
CARBON DISULFIDE	BDL	25	ug/L
CARBON TETRACHLORIDE	BDL	25	ug/L
CHLOROBENZENE	BDL	25	ug/L
CHLOROETHANE	BDL	50	ug/L
CHLOROFORM	BDL	25	ug/L
CHLOROMETHANE	BDL	50	ug/L
DIBROMOCHLOROMETHANE	BDL	25	ug/L
CIS-1,3-DICHLOROPROPENE	BDL	25	ug/L
DICHLORODIFLUOROMETHANE	BDL	25	ug/L
1,1-DICHLOROETHANE	BDL	25	ug/L
1,2-DICHLOROETHANE	BDL	25	ug/L
1,1-DICHLOROETHENE	BDL	25	ug/L
1,2-DICHLOROPROPANE	BDL	25	ug/L
ETHYLBENZENE	120	25	ug/L
FLUOROTRICHLOROMETHANE	BDL	25	ug/L
2-HEXANONE	BDL	50	ug/L
METHYLENE CHLORIDE	BDL	25	ug/L
METHYL ETHYL KETONE	BDL	50	ug/L ug/L
4-METHYL-2-PENTANONE	BDL	50	ug/L
STYRENE	BDL	25	ug/L ug/L
1,1,2,2-TETRACHLOROETHANE	BDL	25	ug/L ug/L
TETRACHLOROETHENE	BDL	25	
TETRAHYDROFURAN	BDL		ug/L
TOLUENE	34	120	ug/L
1,2-DICHLOROETHENE (TOTAL)	BDL	25	ug/L
TRANS-1,3-DICHLOROPROPENE	l	25	ug/L
1,1,1-TRICHLOROETHANE	BDL	25	ug/L
1,1,2-TRICHLOROETHANE	BDL	25	ug/L
LI, I, L- I KIUNLUKUE I NANE	BDL	25	ug/L

Page 1 (continued on next page)

Lab Sample ID: C149653

Parameter TRICHLOROETHENE VINYL ACETATE VINYL CHLORIDE XYLENE (TOTAL) ALSO DETECTED	Result BDL BDL BDL 370	Det. Limit 25 50 50 25	Units ug/L ug/L ug/L ug/L
BENZOFURAN UNKNOWN C9 HYDROCARBON	EST 70 RT=33.09 EST 760 RT=34.76		
SURROGATE RECOVERY			
DICHLOROETHANE-D4 TOLUENE-D8 BROMOFLUOROBENZENE	98 98 98		% Rec % Rec % Rec

SAMPLE WAS ANALYZED AT A 1:5 DILUTION.

^{*} This value is outside of the linear calibration range. The sample will be diluted and reanalyzed.

Analyst: L. DIAZ Analysis Date: 19-AUG-9	73 10:41 Instrument: GC/MS VOA	Test: 0	510.3.1
Parameter	Result	Det. Limit	units
BENZENE	6400	250	ug/L
SURROGATE RECOVERY			
DICHLOROETHANE-D4	105	-	% Rec
TOLUENE-D8	106		% Rec
BROMOFLUOROBENZENE	106		% Rec

GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACT	ON SW846-3510A		•
Analyst: H. QIAN Analysis Date: 17-AUG-93		Test: P233.	4.0
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1000		mL
FINAL VOLUME	1		mL

SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/ACID FRACTIONS) SW846-8270A Analyst: H. QIAN Analysis Date: 18-AUG-93 20:09 Instrument: GC/MS SVOA Te Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION SW846-3510A P233.4.0			5.3.0
Parameter	Result	Det. Limit	Units
ACENAPHTHENE	1900	200	ug/L
ACENAPHTHYLENE	BDL	200	ug/L
ANTHRACENE	EST 110	200	ug/L
BENZ(A)ANTHRACENE	BDL		ug/L
BENZO(A)PYRENE	BDL		ug/L
BENZO(B) FLUORANTHENE	BDL		ug/L
BENZO(G,H,I)PERYLENE	BDL		ug/L
BENZO(K)FLUORANTHENE	BDL		ug/L
BENZYL ALCOHOL	BDL		ug/L
BENZYLBUTYLPHTHALATE	BDL	,	ug/L
BIS(2-CHLOROETHOXY)METHANE	BDL		ug/L
BIS(2-CHLOROETHYL)ETHER	BDL		ug/L
BIS(2-CHLOROISOPROPYL)ETHER	BDL	t t	ug/L
BIS(2-ETHYLHEXYL)PHTHÁLATE	BDL	1 1	ug/L
4-BROMOPHENYLPHENYLETHER	BDL	E I	ug/L
CARBAZOLE	BDL	i i	ug/L

MEKITAGE LABUKATURIES, INC.		·	
Parameter	Result	Det. Limit	Units
4-CHLOROANILINE	BDL	200	ug/L
2-CHLORONAPHTHALENE	BDL	200	ug/L
4-CHLOROPHENYLPHENYLETHER	BDL	200	ug/L
CHRYSENE	BDL	200	ug/L
DIBENZ(A,H)ANTHRACENE	BDL	200	ug/L
DIBENZÔFÚRÁN	1500	200	ug/L
1,2-DICHLOROBENZENE	BDL	200	ug/L
1,3-DICHLOROBENZENE	BDL	200	ug/L
1,4-DICHLOROBENZENE	BDL	200	ug/L
3,3'-DICHLOROBENZIDINE	BDL	400	ug/L
DIETHYLPHTHALATE	BDL	200	ug/L
DIMETHYLPHTHALATE	BDL	200	ug/L
DI-N-BUTYLPHTHALATE	BDL	200	ug/L
DINITROBENZENES	BDL	1000	ug/L
2,4-DINITROTOLUENE	BDL	200	ug/L
	BDL	200	
2,6-DINITROTOLUENE	BDL	200	ug/L
DI-N-OCTYLPHTHALATE	BDL	200	ug/L
FLUORANTHENE			ug/L
FLUORENE NECACHI ODORENZENE	1100	200 200	ug/L
HEXACHLOROBENZENE	BDL		ug/L
HEXACHLOROBUTADIENE	BDL	200	ug/L
HEXACHLOROCYCLOPENTADIENE	BDL	200	ug/L
HEXACHLOROETHANE	BDL	200	ug/L
INDENO(1,2,3-CD)PYRENE	BDL	200	ug/L
ISOPHORONE	BDL	200	ug/L
2-METHYLNAPHTHALENE	1600	200	ug/L
NAPHTHALENE	1300	200	ug/L
2-NITROANILINE	BDL	1000	ug/L
3-NITROANILINE	BDL	1000	ug/L
4-NITROANILINE	BDL	1000	ug/L
NITROBENZENE	BDL	200	ug/L
N-NITROSO-DIPHENYLAMINE	BDL	200	ug/L
N-NITROSO-DI-N-PROPYLAMINE	BDL	200	ug/L
PHENANTHRENE	530	200	ug/L
2-PICOLINE	BDL	1000	ug/L
PYRENE	BDL	200	ug/L
PYRIDINE	BDL	1000	ug/L
TETRACHLOROBENZENES	BDL	200	ug/L
TOLUENEDIAMINE	BDL	1000	ug/L
1,2,4-TRICHLOROBENZENE	BDL	200	ug/L
BENZOIC ACID	BDL	1000	ug/L
4-CHLORO-3-METHYLPHENOL	BDL	200	ug/L
2-CHLOROPHENOL	BDL	200	ug/L
2,4-DICHLOROPHENOL	BDL	200	ug/L
2,4-DIMETHYLPHENOL	BDL	200	ug/L
4,6-DINITRO-2-METHYLPHENOL	BDL	1000	ug/L
2,4-DINITROPHENOL	BDL	1000	ug/L
2-METHYLPHENOL	BDL	200	ug/L ug/L
4-METHYLPHENOL	BDL	200	
2-NITROPHENOL	BDL	200	ug/L
4-NITROPHENOL	BDL	1000	ug/L
PENTACHLOROPHENOL	BDL		ug/L
PHENOL	BDL	1000	ug/L
TETRACHLOROPHENOL		200	ug/L
2,4,5-TRICHLOROPHENOL	BDL	200	ug/L
2,4,6-TRICHLOROPHENOL	BDL	1000	ug/L
ב, ד, ט־ותונהבטרהבווטב	BDL	200	ug/L
L <u>•</u>			

Lab Sample ID: C149653

Parameter SURROGATE RECOVERY	Result	Det. Limit	Units
2-FLUOROPHENOL	*		
PHENOL-D5	*		
NITROBENZENE-D5 2-FLUOROBIPHENYL	* *		
2,4,6-TRIBROMOPHENOL	*		
TERPHENYL-D14 * SURROGATES DILUTED OUT.	*		<u> </u>
SURRUGATES DILUTED OUT.			·

CYANIDE AMENABLE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 26-AUG-93		Test: P111.	4.0
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 250 250	Det. Limit	Units ML ML
CYANIDE, AMENABLE TO CHLORINATION (MANUAL) SW8 Analyst: J. MATTEI Analysis Date: 27-AUG-93 Prep: CYANIDE AMENABLE DISTILLATION SW846-9010A P111.4.0	46-9010A	Test: G119.	6.0
Parameter CYANIDE, AMENABLE	Result	Det. Limit	Units mg/L

CYANIDE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 18-AUG-93		Test: P101.	4.0
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	250	•	mL
FINAL VOLUME	250		mL

CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Analysis Date: 20-AUG-93 Prep: CYANIDE DISTILLATION SW846-9010A P101.4.0		Test: G119.5.0
Parameter	Result	Det. Limit Units
CYANIDE	.15	.01 mg/L

PH (AQUEOUS) SW846-9040 Analyst: C. QUARLES Analysis Date: 17-AUG-93		Test: G607.5	.0
Parameter PH	Result 7.7	Det. Limit 0.1	Units Std. Units

FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPL Analyst: S. CARDWELL Analysis Date: 20-AUG-93		Test: P130	.4.1 INDI
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	50		l mL
FINAL WEIGHT OR VOLUME	50		mL

BARIUM ICP SW846-6	6010A			
Analyst: M. JAO Analysis Date: 24-AUG-93 09:00 Instrument: ICP Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3005A P130.4.1			Test: M104.3.0 INDI	
BARIUM	Parameter	Result 0.051	Det. Limit 0.010	Units mg/L

		Lab Sample ID: C149653
CADMIUM ICP SW846-6010A Analyst: M. JAO Analysis Date: 26-AUG-93 08: Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30		Test: M108.3.0 INDI
	······································	
CADMIUM Parameter	Result BDL	Det. Limit Units 0.0050 mg/L
CHROMIUM ICP SW846-6010A		
Analyst: M. JAO Analysis Date: 24-AUG-93 09: Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30		Test: M110.3.0 INDI
Parameter CHROMIUM	Result BDL	Det. Limit Units 0.010 mg/L
LEAD ICP SW846-6010A Analyst: M. JAO Analysis Date: 24-AUG-93 09: Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30		Test: M116.3.0 INDI
Parameter LEAD	Result BDL	Det. Limit Units 0.050 mg/L
SILVER ICP SW846-6010A Analyst: M. JAO Analysis Date: 24-AUG-93 09: Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-30		Test: M130.3.0 INDI
Parameter SILVER	Result BDL	Det. Limit Units 0.010 mg/L
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW840 Analyst: J. ULASZEK Analysis Date: 17-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME	Result 50 50	Test: P130.6.0 Det. Limit Units ML ML
ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P1		Test: M103.2.0
Parameter ARSENIC	Result .021	Det. Limit Units .010 mg/L
ARSENIC SELENIUM GFAA SW846-7740	.021 Instrument: GFAA	
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93	.021 Instrument: GFAA	.010 mg/L
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P1 Parameter	Instrument: GFAA 30.6.0 Result BDL	.010 mg/L Test: M128.2.0 Det. Limit Units .010 mg/L
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P1 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPI	Instrument: GFAA 30.6.0 Result BDL	.010 mg/L Test: M128.2.0 Det. Limit Units
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020A P1 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPI Analyst: A. ROBERTSON Analysis Date: 18-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME MERCURY CVAA SW846-7470	Instrument: GFAA 30.6.0 Result BDL Result 100 100 Instrument: CVAA	.010 mg/L Test: M128.2.0 Det. Limit Units .010 mg/L Test: P131.6.0 INDI Det. Limit Units mL

Lab Sample ID: C149653

FLASH POINT BY PENSKY-MARTENS CLOSED TESTER AST Analyst: L. RYBSKI Analysis Date: 18-AUG-93	M D-93	Test: G509	.9.0
Parameter FLASH POINT	Result * 210	Det. Limit	Units Degrees F
BOILED AT 210 DEGREES			

TOTAL AVAILABLE SULFIDE EXTRACTION SW 7.3.4.1 Analysis Date: 17-AUG-93		Test: P116.2	·.0
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	250	1 1	mL
FINAL VOLUME	250		mL

SULFIDE SW846-9030A Analyst: L. RYBSKI Analysis Date: 17-AUG-93		Test: G110.4.0
Parameter SULFIDE	Result BDL	Det. Limit Units 4 mg/L

CYANIDE, TOTAL AVAILABLE (MANUAL) SW 7.3.3.2 Analyst: J. MATTEI Analysis Date: 20-AUG-93		Test: G115.1.0
Parameter	Result	Det. Limit Units
CYANIDE	BDL	.01 mg/L

Sample Comments

* See Note for Parameter

BDL Below Detection Limit

EST Estimated Value

RT Retention Time

Sample chain of custody number 5-04314.

This Certificate shall not be reproduced, except in full, without the written approval of the lab.

9-1-93

Quality Assurance Officer: Page 6 (last page)

CERTIFICATE OF ANALYSIS

Service Location Received Project Lab ID HERITAGE LABORATORIES, INC. 16-AUG-93 C149652 1319 MARQUETTE DRIVE PO Number Complete ROMEOVILLE, IL 60441 (708)378-1600 30-AUG-93 **VERBAL** Printed Sampled 31-AUG-93 13-AUG-93

Report To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130 Bill To

EMILY LANDIS ECOLOGY AND ENVIROMENT, INC. 6777 ENGLE ROAD CLEVELAND, OH 44130

Sample Description

DESCRIPTION: DW 4-WELL BY SUBSTATION 5

VOLATILE ORGANICS SW846-8240A Analyst: L. DIAZ Analysis Date: 19-AUG-93 14:39 Ins	trument: GC/MS VOA	Test: 0	510.3.0
Parameter	Result	Det. Limit	Units
ACETONE	BDL	20	ug/L
ACROLEIN	BDL	50	ug/L
ACRYLONITRILE	BDL	70	ug/L
BENZENE	12	5	ug/L
BROMODICHLOROMETHANE	BDL	5	ug/L
BROMOFORM	BDL	5	ug/L
BROMOMETHANE	BDL	10	ug/L
CARBON DISULFIDE	BDL	5	ug/L
CARBON TETRACHLORIDE	BDL	5	ug/L
CHLOROBENZENE	BDL	5	ug/L
CHLOROETHANE	BDL	10	ug/L
CHLOROFORM	BDL	5	ug/L
CHLOROMETHANE	BDL	10	ug/L
DIBROMOCHLOROMETHANE	BDL		ug/L
CIS-1,3-DICHLOROPROPENE	BDL	. <u></u>	ug/L
DICHLORODIFLUOROMETHANE	BDL	5	ug/L
1,1-DICHLOROETHANE	BDL	<u>5</u>	ug/L
1,2-DICHLOROETHANE	BDL	. (a	ug/L
1,1-DICHLOROETHENE	BDL	5	ug/L
1,2-DICHLOROPROPANE	BDL	5	ug/L
ETHYLBENZENE	19	5	ug/L
FLUOROTRICHLOROMETHANE	BDL		ug/L
2-HEXANONE	BDL	10	ug/L
METHYLENE CHLORIDE	BDL	5	ug/L
METHYL ETHYL KETONE	BDL	10	ug/L
4-METHYL-2-PENTANONE	BDL - AMERICA -	10	ug/L
STYRENE	BDL	5	ug/L
1,1,2,2-TETRACHLOROETHANE	BDL	5	ug/L
TETRACHLOROETHENE	BDL	5	ug/L
TETRAHYDROFURAN	BDL	25	ug/L
TOLUENE (TOTAL)	EST 3	5	ug/L
1,2-DICHLOROETHENE (TOTAL)	BDL	5	ug/L
TRANS-1,3-DICHLOROPROPENE	BDL	5	ug/L
1,1,1-TRICHLOROETHANE	BDL		ug/L
1,1,2-TRICHLOROETHANE	BDL	5	ug/L

Page 1 (continued on next page)

Lab Sample ID: C149652

Parameter	Result	Det. Limit	Units
TRICHLOROETHENE	BDL	5	ug/L
VINYL ACETATE	BDL	10	ug/L
VINYL CHLORIDE	BDL	10	ug/L
XYLENE (TOTAL)	250	5	ug/L
1,1-DICHLOROETHANE	8	5	ug/L
ALSO DETECTED			
UNKNOWN C9 HYDROCARBON	EST 240 RT=34.83		
. C. (-)			
SURROGATE RECOVERY			
DICHLOROETHANE-D4	107		
TOLUENE - D8	* 85		
BROMOFLUOROBENZENE	* 118		
Sample reanalyzed with no improvement in surrogat	e recovery.	· · · · · · · · · · · · · · · · · ·	
	-		•

GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION Analyst: H. QIAN Analysis Date: 17-AUG-93	SW846-3510A	Test: P233.4	.0
Parameter	Result	Det. Limit	Units
INITIAL WEIGHT OR VOLUME	1000	!	mL
FINAL VOLUME	1		mL -

SEMI-VOLATILE ORGANICS (BASE/NEUTRAL/AC Analyst: H. GIAN Analysis Date: 17-AUG- Prep: GC/MS SEPARATORY FUNNEL LIQUID-LIQUID EXTRACTION	-93 18:37 Instrument: GC/MS SVOA	Test: 05	605.3.0
Parameter	Result	Det. Limit	Units
ACENAPHTHENE	43	10	ug/L
ACENAPHTHYLENE	BDL	10	ug/L
ANTHRACENE	BDL	10	ug/L
BENZ (A) ANTHRACENE	BDL	10	ug/L
BENZÒ(Á)PYRENE	BDL	10	ug/L
BENZO(B)FLUORANTHENE	BDL	10	ug/L
BENZO(G,H,I)PERYLENE	BDL	10	ug/L
BENZO(K) FLUORANTHENE	BDL	10	ug/L
BENZYL ALCOHOL	BDL	10	ug/L
BENZYLBUTYLPHTHALATE	BDL	10	ug/L
BIS(2-CHLOROETHOXY)METHANE	BDL	10	ug/L
BIS(2-CHLOROETHYL)ETHER	BDL	10	ug/L
BIS(2-CHLOROISOPROPYL)ETHER	BDL	10	ug/L
BIS(2-ETHYLHEXYL)PHTHALATE	BDL Harrist Edition	10	ug/L
4-BROMOPHENYLPHENYLETHER	BDL	10	ug/L
CARBAZOLE	BDL	10	ug/L
4-CHLOROANILINE	BDL	10	ug/L
2-CHLORONAPHTHALENE	BDL	10	ug/L
4-CHLOROPHENYLPHENYLETHER	BDL	10	ug/L
CHRYSENE	BDL	10	ug/L
DIBENZ(A,H)ANTHRACENE	BDL	10	ug/L
DIBENZOFURAN	BDL	10	
1,2-DICHLOROBENZENE	BDL	10	ug/L
1,3-DICHLOROBENZENE	Lis talam is a BDL a trade in the case of a	10	ug/L
l,4-DICHLOROBENZENE	BDL	10	ug/L
3,3'-DICHLOROBENZIDINE	BDL	20	ug/L
DIETHYLPHTHALATE	BDL	10	ug/L
DIMETHYLPHTHALATE			ug/L
)I-N-BUTYLPHTHALATE	BDL	10	ug/L
DINITROBENZENES	BDL BARRETTE FAX	50	ug/L
2,4-DINITROTOLUENE	BDL	10	ug/L

Page 2 (continued on next page)

December	Result	Det. Limit	Units
Parameter 2,6-DINITROTOLUENE	BDL	10	ug/L
DI-N-OCTYLPHTHALATE	BDL	10	ug/L ug/L
FLUORANTHENE	11	10	ug/L ug/L
FLUORENE	BDL	10	ug/L ug/L
HEXACHLOROBENZENE	BDL	10	ug/L ug/L
HEXACHLOROBUTADIENE	BDL	10	ug/L ug/L
HEXACHLOROCYCLOPENTADIENE	BDL	10	ug/L ug/L
HEXACHLOROETHANE	BDE	10	ug/L ug/L
	BDL	10	ug/L ug/L
INDENO(1,2,3-CD)PYRENE ISOPHORONE	BDL	10	ug/L ug/L
2-METHYLNAPHTHALENE	BDL	10	ug/L ug/L
NAPHTHALENE	BDL	10	ug/L ug/L
2-NITROANILINE	BDL	50	ug/L ug/L
3-NITROANILINE	BDL	50	
	BDL		ug/L
4-NITROANILINE NITROBENZENE	BDL	50 10	ug/L
N-NITROBENZENE N-NITROSO-DIPHENYLAMINE	BDL		ug/L
	1	10	ug/L
N-NITROSO-DI-N-PROPYLAMINE	BDL BDL	10	ug/L
PHENANTHRENE	BUL 55	10 50	ug/L
2-PICOLINE	EST 9		ug/L
PYRENE PYRIDINE	EST 24	10 50	ug/L
	BDL		ug/L
TETRACHLOROBENZENES	BDL	10 50	ug/L
TOLUENEDIAMINE	BDL	50	ug/L
1,2,4-TRICHLOROBENZENE	BDL	10	ug/L
BENZOIC ACID	BDL -	50	ug/L
4-CHLORO-3-METHYLPHENOL	BDL	10	ug/L
2-CHLOROPHENOL	BDL	10 10	ug/L ug/L
2,4-DICHLOROPHENOL	25	10	
2,4-DIMETHYLPHENOL 4,6-DINITRO-2-METHYLPHENOL	BDL	50	ug/L
4,6-DINITRO-Z-METHYLPHENOL 2,4-DINITROPHENOL	BDL	50	ug/L
2-METHYLPHENOL	BDL	10	ug/L ug/L
	BDL	10	ug/L ug/L
4-METHYLPHENOL 2-NITROPHENOL	BDL	10	ug/L ug/L
4-NITROPHENOL	BDL	50	ug/L ug/L
PENTACHLOROPHENOL	BDL	50	ug/L ug/L
PHENOL	BDL	10	
TETRACHLOROPHENOL	BDI	10	ug/L ug/L
2,4,5-TRICHLOROPHENOL	BDL		ug/L ug/L
2,4,6-TRICHLOROPHENOL	BDL	10	ug/L
erika finantzaratur berarat beri ili elektrilikerilik ezer, ili bilik ili elektrilik biler biriliki ker			ug/ L
SUBDOCATE DECOVERY			
SURROGATE RECOVERY			
2-FLUOROPHENOL	50	u Marawiii da Lu	% Rec
PHENOL-D5	42 /		% Rec
	56	resenti distributa di 1999 	% Rec
NITROBENZENE - D5	73		% Rec
2-FLUOROBIPHENYL	99		% Rec
2,4,6-TRIBROMOPHENOL TERPHENYL-D14	83		
ICKMENIL-U14	03:		% Rec

MERITAGE LABORATORIES, INC.		Lab Sample ID: C149652
CYANIDE AMENABLE DISTILLATION SW846-9010A Analyst: J. MATTEL Analysis Date: 26-AUG-93		Test: P111.4:0
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 250 250	Det. Limit Units mL
CYANIDE, AMENABLE TO CHLORINATION (MANUAL) Analyst: J. MATTEI Analysis Date: 27-AUG-93 Prep: CYANIDE AMENABLE DISTILLATION SW846-9010A P111.4.0	SW846-9010A	Test: G119.6.0
Parameter CYANIDE, AMENABLE	Result	Det. Limit Units .01 mg/L
CYANIDE DISTILLATION SW846-9010A Analyst: J. MATTEI Analysis Date: 18-AUG-93		Test: P101.4.0
Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME	Result 250 250	Det. Limit Units mL mL
CYANIDE, TOTAL (MANUAL) SW846-9010A Analyst: J. MATTEI Analysis Date: 20-AUG-93 Prep: CYANIDE DISTILLATION SW846-9010A P101.4.0		Test: G119:5.0
Parameter CYANIDE	Result	Det. Limit Units .01 mg/L
PH (AQUEOUS) SW846-9040 Analyst: C. QUARLES Analysis Date: 17-AUG-93		Test: G607:5:0
Parameter PH	Result 8.0	Det. Limit Units O.1 Std. Unit
FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLE Analyst: S. CARDWELL Analysis Date: 20-AUG-93	ES SW846-3005A	Test::P130:4.1
Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME	Result 50 50	Det. Limit Units mL
INSUFFICIENT SAMPLE TO USE AS QC BARIUM ICP SW846-6010A Analyst: M. JAO Analysis Date: 24-AUG-93 09 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3		Test: M104.3:0 [ND]
Parameter BARIUM	Result 0.058	Det. Limit Units 0.010 mg/L
CADMIUM ICP SW846-6010A Analyst: M. JAO Analysis Date: 26-AUG-93 08 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3	inner er ververn er nocht gegen wurdt. Die noch er in 1966 in er verbilligen 2001 von 1980 in 1980 i	Test: M108.3.0 IND1
Parameter CADMIUM	Result BDL	Det. Limit Units 0.0050 mg/L
CHROMIUM ICP SW846-6010A Analysis Date: 24-AUG-93 09 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW846-3	Babbala Babilan in Englandin Englandin England at 1990 in 1990 in 1990 in 1990 in 1990 in 1990 in 1990 ann ann	Test: M110:3;0 INDI
Parameter CHROMIUM	Result BDL	Det. Limit Units 0.010 mg/L

HERITAGE LABORATORIES, INC.		Lab Sample ID: C149652
LEAD ICP SW846-6010A Analyst: M. JAO Analysis Date: 24-AUG-93 Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW84		Test::M116.3.0 INDI
Parameter LEAD	Result , BDL	Det. Limit Units 0.050 mg/L
SILVER ICP SW846-6010A Analyst: M. JAC Prep: FAA OR ICP ACID DIGESTION OF AQUEOUS SAMPLES SW84	5.09:00	Test::M130.3.0 INDI
Parameter SILVER	Result BDL	Det. Limit Units 0.010 mg/L
GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW Analyst: J. ULASZEK Analysis Date: 17-AUG-93		Test:::P130:6:0
Parameter INITIAL WEIGHT OR VOLUME FINAL WEIGHT OR VOLUME	Result 50 50	Det. Limit Units mL mL
ARSENIC GFAA SW846-7060 Analyst: T. NOHA Analysis Date: 20-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020		Test::M103:2:0
Parameter ARSENIC	Result .032	Det. Limit Units .010 mg/L
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter	.032	.010 mg/L Test: M128.2:0 Det. Limit Units
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SA	.032 Instrument: GFAA DA P130.6.0 Result BDL AMPLES SW846-7470	.010 mg/L Test: M128.2.0 Det. Limit Units .010 mg/L
ARSENIC SELENIUM GFAA SW846-7740 Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM	.032 Instrument: GFAA DA P130.6.0 Result BDL AMPLES SW846-7470	.010 mg/L Test: M128.2.0 Det. Limit Units .010 mg/L
ARSENIC SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES ANALYST: A. ROBERTSON Analysis Date: 18-AUG-93 Parameter INITIAL WEIGHT OR VOLUME	.032 Instrument: GFAA DA P130.6.0 Result BDL AMPLES SW846-7470 Result 100 100 Instrument: CVAA	.010 mg/L Test: M128.2:0 Det. Limit Units .010 mg/L Test: P131.6.0 INDI Det. Limit Units mL
ARSENIC SELENIUM GFAA SW846-7740 Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter Analysi: A. ROBERTSON Analysis Date: 18-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME MERCURY CVAA SW846-7470 Analysis Date: 19-AUG-93	.032 Instrument: GFAA DA P130.6.0 Result BDL AMPLES SW846-7470 Result 100 100 Instrument: CVAA	.010 mg/L Test: M128.2.0 Det. Limit Units mg/L Test: P131.6.0 IND1 Det. Limit Units mL mL
SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter Analyst: A. ROBERTSON Analysis Date: 18-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME MERCURY CVAA SW846-7470 Analyst: A. ROBERTSON Analysis Date: 19-AUG-93 Prep: MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW	.032 B Instrument: GFAA DA P130.6.0 Result BDL AMPLES SW846-7470 B Result 100 100 Result 100 Result 100 Result 100 Result 100 TER ASTM D-93	.010 mg/L Test::M128:2:0 Det. Limit Units .010 mg/L Test::P131:6:0 INDI Det. Limit Units mL mL Test::M120:1:0 INDI
SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter Analyst: A. ROBERTSON Analysis Date: 18-AUG-93 Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME MERCURY CVAA SW846-7470 Analyst: A. ROBERTSON Analysis Date: 19-AUG-93 Prep: MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW Parameter MERCURY FLASH POINT BY PENSKY-MARTENS CLOSED TEST Analyst: L. RYBSKI Analysis Date: 18-AUG-93 Parameter FLASH POINT	.032 Instrument: GFAA DA P130.6.0 Result BDL AMPLES SW846-7470 Result 100 100 Result 100 Result 100 Result 100 Result 100 TER ASTM D-93	.010 mg/L Test:: M128.2:0 Det. Limit Units .010 mg/L Test:: P131.6:0 INDI Det. Limit Units mL mL Test:: M120.1:0 INDI Det. Limit Units o.00050 mg/L
SELENIUM GFAA SW846-7740 Analyst: T. NOHA Analysis Date: 24-AUG-93 Prep: GFAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter SELENIUM MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW846-3020 Parameter INITIAL WEIGHT OR VOLUME FINAL VOLUME MERCURY CVAA SW846-7470 Analyst: A. ROBERTSON Analysis Date: 19-AUG-93 Prep: MERCURY CVAA SW846-7470 Analyst: A. ROBERTSON Analysis Date: 19-AUG-93 Prep: MERCURY CVAA ACID DIGESTION OF AQUEOUS SAMPLES SW Parameter MERCURY FLASH POINT BY PENSKY-MARTENS CLOSED TEST Analyst: L. RYBSKI Analysis Date: 18-AUG-93 Parameter	.032 Instrument: GFAA DA P130:6:0 Result BDL AMPLES SW846-7470 Result 100 100 Result 100 Result 100 Result 2466-7470 P131.6:0 Result BDL TER ASTM D-93 Result * 210	.010 mg/L Test:: M128.2:0 Det. Limit Units .010 mg/L Test:: P131.6:0 INDI Det. Limit Units mL

Lab Sample ID: C149652

SULFIDE SW846-9030A Analyst: L. RYBSKI Analysis Date: 17-AUG-93		Test: G110.4.0
Parameter	Result	Det. Limit Units
SULFIDE	BDL	4 mg/L

Analyst: J. MATTEI Analysis Date: 20-AUG-93		est: G115.1	•0
Parameter Res	ult Det	. Limit	Units
CYANIDE BDL		.01	mg/L

Sample Comments

* See Note for Parameter BDL Below Detection Limit

EST Estimated Value
RT Retention Time

Sample chain of custody number 5-04314.

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9-1-93

Quality Assurance Officer: __



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